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GROUP 2.21...  
CLASS 28.5...  
RECORDED

ICATION

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GREAT BRITAIN (19)  
GROUP 2.21...  
CLASS 28.5...  
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(54) IMPROVEMENTS IN PIPE UNIONS

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member by co-operation between the  
flanges of the nut and the tubular  
member on tightening of the union  
nut onto the first member, and a  
further metallic member secured to the  
other end of the tubular member and  
adapted to screw-threadedly engage with  
the second screw-threaded member, the  
union nut being held captive on the tubular  
member by the flange on the tubular  
member and said further member which has  
a sufficiently large transverse dimension to  
prevent passage of the union nut over said  
further member.

Unions of this kind have been used for  
connecting gas appliances together, for  
connecting a meter service governor to a  
meter for example.

It is known to connect the tubular member  
to said further member after assembly of the  
union nut onto the tubular member by  
screwing and brazing the tubular member to  
said further member.

This is, however, an expensive operation,  
requires testing of the seal between the two  
members, and has a high reject rate.  
Moreover the seal between the two  
members may be broken when the union is

SPEY

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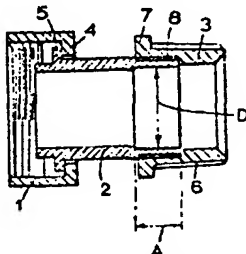
\*A1007Y/01 \*GB 1460-864

Mfg. pipe union for incompatible threaded members - by threading  
tubular member, fitting union nut, screwing end member on and  
deforming threaded joint

SPERRY & CO LTD 14.03.74-GB-011308

(06.01.77) F16L19

A pipe union for two incompatible threaded members is  
formed from a stamped union nut (1) held captive on a sta-  
mped and machined tubular member  
(2) secured to a forged member (3).  
The nut is tapped and the member (3)  
has an external tapered thread (6).  
The union is formed by first forming  
a thread on one end of the tubular  
member (2) and then passing the nut  
over this end. The member (3) is  
then screwed onto the tubular mem-  
ber and a ball plunger or roller bur-  
nishing tool inserted to expand the  
joint to bind the threads of the joint together to form a gas  
tight seal. 13.6.75 (4pp)



other end is formed with an external screw  
thread for engagement with a co-operating  
internal screw thread formed in said further  
member.

Usually the further member will be  
formed with an external radially extending  
polygonal flange for engagement by a  
spanner when the further member is  
tightened in use to the second member. It is  
this polygonal flange which would prevent  
assembly of the union nut onto the tubular  
member if the tubular member were to be  
made integral with the further member.

The tubular member and the further  
member may be made of any suitable metal  
but preferably they are made of brass.

The expansion of the joint between the  
tubular member and the further member is  
conveniently performed by cold forming  
with a ball plunger or roller burnishing tool.

The invention will now be further  
described, by way of example only, with  
reference to the accompanying drawing  
which is an axial cross section of a com-  
pleted brass union adapted to secure an  
externally screw-threaded first member to an  
internally screw-threaded second  
member to provide fluid communication  
therebetween.

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internally screw-threaded second  
member to provide fluid communication  
therebetween.

The union comprises a stamped union nut 1 held captive on a stamped and machined tubular member 2 secured to a further member 3 which is a forging.

5 The union nut 1 is internally screw-threaded for engagement with external screw threads on a first member, not shown, and is provided with an internal radial flange 4 for engagement with an external radial flange 5 which is an integral part of one end of the tubular member 2. When the union nut 1 is screwed in use onto the first member the tubular member 2 is drawn towards the first member by the engagement between the flanges 4 and 5.

15 The further member 3 is formed with an external tapered screw thread 6 for engagement with an internal co-operating screw thread of a second member, not shown, and is provided with an integral polygonal radial flange 7 for engagement by a spanner during tightening in use of the further member 7 to the second member.

20 Initially the other end 8 of the tubular member 3 comprises a plain sleeve. Prior to assembly of the union nut 1 onto the sleeve the exterior of said other end 8 is formed with a plain external screw thread for engagement with a complementary screw thread formed internally of the further member 3. The union nut is then assembled onto the tubular member 2 by passing it over said other end 8 of the tubular member. The tubular member and the further member are then screwed together and a ball plunger or roller burnishing tool is inserted into the joint between the members by passing it through the further member 3, and the joint between the members is expanded radially over the distance A by cold forming to increase the internal diameter D of the joint and to bind the screw threads of the joint together to form a gas-tight seal between the tubular member 2 and the further member 3.

45 In one example the initial diameter D is 0.875 inches and a plunging tool of 0.925" diameter is used. The diameter D is thus increased by slightly more than 4% of its initial value.

50 In order to increase the break-loose torque of the joint between the members 2 and 3 a drop of a screw-thread locking material such as that sold under the Registered Trade Mark 'LOCTITE' 55 STULOCK (OR GRADE 75) is applied to the middle part of one of the screw threads before the members 2 and 3 are screwed together.

#### WHAT WE CLAIM IS:—

1. A method of manufacturing a pipe union of the kind set forth comprising forming said other end of the tubular member and said further member with complementary screw threads, assembling the union nut onto the tubular member by passing it over said other end of the tubular members, screwing said tubular member to said further member, and then permanently deforming the screw-threaded joint between said tubular member and said further member by expanding the joint radially.

2. The method according to claim 1 in which the tubular member is formed with its screw thread prior to assembling the union nut onto the tubular member.

3. The method according to claim 1 or claim 2 in which prior to screwing the tubular member to said further member screw-thread locking material is applied to at least one of the co-operating screw threads.

4. The method according to any of the preceding claims in which the co-operating screw threads comprise an external screw thread formed on the tubular member and an internal screw thread formed on said further member.

5. The method according to any of the preceding claims in which the expansion of the joint is performed by cold forming.

6. The method according to claim 5 in which the joint between the tubular member is expanded by insertion of a ball plunger.

7. The method according to claim 5 in which the joint between the tubular member is expanded by a roller burnishing tool.

8. The method according to any of the preceding claims in which the tubular member and said further member are of brass.

9. The method according to any of the preceding claims in which the internal diameter of the joint between the tubular member and said further member is increased by more than four per cent of the initial diameter.

10. The method according to claim 1 and substantially as described with reference to the accompanying drawing.

11. A pipe union of the kind set forth produced by the method according to any of the preceding claims.

12. A pipe union of the kind set forth manufactured according to the method of claim 10 and substantially as described with reference to the accompanying drawing.

The union comprises a stamped union nut 1 held captive on a stamped and machined tubular member 2 secured to a further member 3 which is a forging.

5 The union nut 1 is internally screw-threaded for engagement with external screw threads on a first member, not shown, and is provided with an internal radial flange 4 for engagement with an external radial  
10 flange 5 which is an integral part of one end of the tubular member 2. When the union nut 1 is screwed in use onto the first member the tubular member 2 is drawn towards the first member by the engagement between the flanges 4 and 5.

15 The further member 3 is formed with an external tapered screw thread 6 for engagement with an internal co-operating screw thread of a second member, not shown, and is provided with an integral  
20 polygonal radial flange 7 for engagement by a spanner during tightening in use of the further member 7 to the second member.

25 Initially the other end 8 of the tubular member 3 comprises a plain sleeve. Prior to assembly of the union nut 1 onto the sleeve the exterior of said other end 8 is formed with a plain external screw thread for engagement with a complementary screw  
30 thread formed internally of the further member 3. The union nut is then assembled onto the tubular member 2 by passing it over said other end 8 of the tubular member. The tubular member and the further member are  
35 then screwed together and a ball plunger or roller burnishing tool is inserted into the joint between the members by passing it through the further member 3, and the joint between the members is expanded radially  
40 over the distance A by cold forming to increase the internal diameter D of the joint and to bind the screw threads of the joint together to form a gas-tight seal between the tubular member 2 and the further member  
45 3.

50 In one example the initial diameter D is 0.875 inches and a plunging tool of 0.925 inch diameter is used. The diameter D is thus increased by slightly more than 4% of its initial value.

55 In order to increase the break-loose torque of the joint between the members 2 and 3 a drop of a screw-thread locking material such as that sold under the Registered Trade Mark 'LOCTITE' STULOCK (OR GRADE 75) is applied to the middle part of one of the screw threads before the members 2 and 3 are screwed together.

#### WHAT WE CLAIM IS:—

60 1. A method of manufacturing a pipe union of the kind set forth comprising forming said other end of the tubular member and said further member with complementary screw threads, assembling  
65 the union nut onto the tubular member by passing it over said other end of the tubular members, screwing said tubular member to said further member, and then permanently deforming  
70 the screw-threaded joint between said tubular member and said further member by expanding the joint radially.

75 2. The method according to claim 1 in which the tubular member is formed with its screw thread prior to assembling the union nut onto the tubular member.

80 3. The method according to claim 1 or claim 2 in which prior to screwing the tubular member to said further member screw-thread locking material is applied to at least one of the co-operating screw threads.

85 4. The method according to any of the preceding claims in which the co-operating screw threads comprise an external screw thread formed on the tubular member and an internal screw thread formed on said further member.

90 5. The method according to any of the preceding claims in which the expansion of the joint is performed by cold forming.

95 6. The method according to claim 5 in which the joint between the tubular member is expanded by insertion of a ball plunger.

100 7. The method according to claim 5 in which the joint between the tubular member is expanded by a roller burnishing tool.

105 8. The method according to any of the preceding claims in which the tubular member and said further member are of brass.

110 9. The method according to any of the preceding claims in which the internal diameter of the joint between the tubular member and said further member is increased by more than four per cent of the initial diameter.

115 10. The method according to claim 1 and substantially as described with reference to the accompanying drawing.

11. A pipe union of the kind set forth produced by the method according to any of the preceding claims.

12. A pipe union of the kind set forth manufactured according to the method of claim 10 and substantially as described with reference to the accompanying drawing.

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